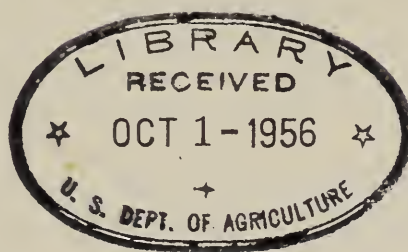


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THE SEED MARKETS  
of  
Australia, New Zealand,  
West Pakistan, Southeast Asia



UNITED STATES DEPARTMENT OF AGRICULTURE  
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THE SEED MARKETS OF AUSTRALIA, NEW ZEALAND,  
PAKISTAN AND SOUTHEAST ASIA

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SUMMARY

Of the countries visited during this market study only Australia and New Zealand may be considered as seed producers. They are both importers and exporters. All of the others are importers, but primarily of vegetable and flower seeds.

The market for vegetable and flower seeds in these 11 countries range from rather small to substantial. However, the lack of foreign exchange, as evidenced by the tight controls over dollar funds, limits their ability to buy American seeds. Only in Hong Kong is trading free. This tends to restrict much of the purchasing to that market. Hong Kong has become an important transshipment point for all of Southeast Asia.

The dollar restriction is, of course, a primary limitation but there are other factors which limit the opportunities for American seedsmen. Much of the seed trade is in the hands of Chinese merchants. A large share of the market supply of vegetables is produced by Chinese farmers. The larger cities have a substantial Chinese population. All of which tends to focus the demand for seeds to those of Chinese types. Thus Hong Kong, which is a distribution point for Chinese-produced seeds, has a major advantage, even though the quality of the seeds is somewhat lacking. However, American seeds are known and liked in these Southeast Asian countries by many of the merchants and farmers.

Grass and legume seeds are almost unknown in these countries located in the tropics. There is some small use made of Berseem clover, sudan grass and millets. Alfalfa was noted in a few places. However, the technicians of the U. S. International Cooperation Administration (formerly FOA) have been doing much to encourage the improvement of range lands and many species of American origin have been tested. It is quite likely that eventually some of this work will be expanded and put into effect both to increase livestock production and to control erosion. If, and when, such programs are expanded there is likely to be a demand for a limited number of kinds of grass and legume seeds.

Australia and New Zealand are also seeking to improve extensive pasture areas, and here too, they have been testing a great many kinds and varieties of grasses and legumes. Some of American production appear promising and may be in demand as this work progresses.



Shipment of seeds into, or across, the tropics offers special problems. Much more work needs to be done to determine the most effective means of protecting seeds under such conditions. Limited shipments packed in tin have been fairly successful, although the weight of the tin adds substantially to the cost of shipment. Just as effective but lighter weight materials should be sought to overcome this handicap.

There is much interest in the improvement of corn production in Southeast Asia and the South Pacific, but the difference in length of day makes American hybrids of little or no value over much of this area. Breeding will have to be done in the various countries using breeding material from the United States, Central America and South America.

In spite of the foregoing factors there is a market in most of these countries for good quality seed of selected varieties of most kinds of vegetables and flowers. The merchants for the most part are friendly to Americans and are anxious and willing to do business. Doing business in that part of the world has some special problems that should be recognized at the outset so that friendly commercial relations can be maintained.

The crop lands of most of the countries surveyed in this area are extensively farmed, especially in the rice producing countries where most of the land that can be irrigated is under cultivation. Under such conditions very little land is available for the production of forage crops or for pasturing livestock. In many of the countries the size of holdings is under five acres. The exceptions to this type of farming are the hill lands that are not suitable for the growing of rice, and the extensive areas in Australia and New Zealand which are devoted to livestock production.

Most of the countries are densely populated. There are a number of cities with large populations, several exceeding a million. Most of these cities have very meager sources of dairy products, and meat is a costly item not enjoyed by any substantial proportion of the population. Vegetables are extensively grown to supplement the rice diet. Here again, Australia and New Zealand are the exceptions and are surplus producers of dairy products and meat. They do not have the density of population of the countries in the rice belt.

The countries visited have one characteristic in common, namely the highly seasonal rainfall which comes mainly in the monsoon season. Some have other periods of lighter rainfall. Even in New Zealand there are areas with substantial rainfall that are difficult to farm because the rainfall is not evenly distributed throughout the growing season. New Zealand and Australia are outside of the rice belt and have winter temperatures and light frosts, whereas in the other countries frosts are a factor only at the higher elevations. In brief, they are in the tropics.

Both New Zealand and Australia are seed producers for the domestic markets and to some extent for export. While they are best known for their production of grass and legume seeds, they also have firms that specialize in vegetable seed production. In the other countries there is some local seed production, mainly by those who have no alternative but to save the seeds they need. Obviously under such conditions there is no seed testing laboratory nor a seed processing plant in any of these countries. As of now, the trade is primarily in vegetable and flower seeds with very little interest in the grass and legume seeds.

The countries and colonies in the rice belt are not seed producers but are importers. This situation comes not from lack of interest but mainly from lack of suitable climatic conditions and, as previously mentioned, from the greater interest in the Chinese types of vegetables.

Imports are controlled primarily through monetary regulations and permits. While these are designed to protect a country's foreign exchange, they operate to direct much of the buying to the Hong Kong market where trading is carried on in most of the currencies of the region.

The table on Page 4 summarizes the restrictions employed to control seed imports in the countries visited. Only one country has a seed law, such as we know. The others depend upon the general trade laws for authority for such regulations as are in force. Most of the countries are aware of the need for controlling insect pests and diseases, hence require a phytopathological certificate and sometimes a certificate of origin.

New Zealand does not have a seed law, but a very efficient Department of Agriculture and a cooperative seed trade provide all of the control necessary or desirable. Australia, on the other hand, has seed trade regulations comparable to those of the United States.

The foregoing is a rather brief over-all picture of the area referred to as Southeast Asia, Pakistan and the South Pacific. A resume of the seed situation in each country follows:

#### Australia

Australia's dollar shortage is the most serious bottleneck to trade with the United States. Most seedsmen interviewed were anxious to buy from America. During the current seed shortage in Europe dollars were being provided for purchases from the United States including flower, vegetable and field seeds. In addition, American seeds were being obtained via New Zealand and Europe.

The fear, based on tragic experiences, of introducing plant diseases and insect pests is reflected in rather strict quarantine regulations which preclude importations of bean, corn, sorghum, soybean, peanut, Sudangrass, tobacco and all of the cereal seeds.



# SUMMARY OF REGULATIONS AFFECTING SLEED IMPORTS AND EXPORTS

	Australia	New Zealand	Pakistan	Burma	Cambodia	Hong Kong	Indonesia	Philippines	Singapore	Thailand	Vietnam
Licenses -											
Import	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Nonetary	Yes	in part	Yes	Yes	Yes	1/	Yes	Yes	Yes	Yes	Yes
Export	Yes	Yes	No	No	No	No	Yes	No	No	No	No
Quality Standards -											
Minimum Germination											
and Purity	Yes	No	No	No	No	No	No	No	No	No	No
Seeds -											
Prohibited list	Yes	No 3/	No	No	No	No	No	No	No	No	No 1
Restricted list	Yes	No	No	No	No	No	No	No	No	No	No 4
Varietal Restrictions	No	orchard only	No	No	No	No	No	No	No	No	No 1
Variety Testing Station	--	Yes	--	--	--	--	--	--	--	--	--
American Varieties Tested	--	Yes	--	--	--	--	--	--	--	--	--
Labeling	Packaged seeds	No	No	No	No	No	No	No	No	No	No
Staining	Orchard alfalfa	No	No	No	No	No	No	No	No	No	No
Statistics - Production	Yes	Yes	No	No	No	No	No	No	No	No	No
Phytopath. Certificates	Yes	Yes	?	No	No	No	Yes 2/	Yes	Yes	No	No
Some Prohibited Seeds	Yes	Orchard	No	Field	No	No	No	No	No	No	No
Certified Seed Production	Yes	Yes	No	No	No	No	No	No	No	No	No
Certificate of Origin	--	Orchard only	No	No	No	No	No	No	No	No	Yes
Seed Laws	Yes	No	No	No	No	No	No	No	No	No	No
Import Duties	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	?	?	?

1/ For some commodities. 2/ Import regulations for insect and disease control under consideration.

3/ Only one Macella, prohibited by law.



The geographical location of Australia makes some kinds of American seeds unsuitable. However, the wide range of climate, soils and rainfall of Australia, a country approximately the size of the United States, requires considerable range in kinds and varieties of plants. Australia is close enough to the tropics so that hardiness is seldom a factor in variety selection.

Australians are well acquainted with most kinds and varieties of American seeds through a well organized plant introduction service, as well as through the activities of commercial seedsmen and plant growers.

Australia has fairly high standards of quality for all seeds in commerce which apply to imported as well as domestic supplies. Receiving and keeping seeds viable is a problem for the northern portion of Australia. Some studies have been made of this problem of high temperatures and high humidity. Even those seeds destined for Central and South Australia pass through the tropics en route and must be protected.

Australia produces a considerable list of seeds. The major kinds are subterranean clover (6 varieties), irrigated white clover, Wimmera ryegrass (an annual), Hardinggrass, Dallis grass and hybrid seed corn. Only subterranean clover, Dallis grass and corn are produced in sufficient quantity to supply domestic demand.

Most kinds of vegetable seeds are produced in Australia by two firms. Imports are needed to supplement their production. Garden peas are largely imported from New Zealand. Because of a virus disease, the ordinary varieties of carrots can be used only to a limited extent. Areas of seed production are widely scattered from Tasmania to Queensland.

Forage is the big crop in Australia and is the basis for the tremendous sheep population as well as the cattle. Most of the grazing lands have only the native plants, although in recent years pasture improvement by seeding and fertilization with phosphates has been practiced to an increasing extent. Many of the native plants during the dry dormant stage have little nutritional value. Consequently, considerable study and research is being carried on to improve the productivity of the grasslands. Not only are many introduced species in addition to native plants under test, but all are being examined for more productive clones. Some results indicate that it is possible to carry as many as 8 sheep per acre compared to the usual one ewe or less. Many problems of plant nutrition have been discovered and are being studied. Phosphate and sulphur are two of the major deficiencies. Boron, copper and cobalt are others. Bloat is a common problem in Australia.

The resettlement program for ex-servicemen has been an important factor in the improvement of grasslands and is likely to continue to be a factor for some years. However, much attention is being given to pasture improvement in all sections of the country.

The production of grass and legume seeds in Australia has shown some growth over the years, largely through the efforts of the commercial seed handlers. The Government has not shown any particular interest in the business, hence it has a widely fluctuating volume. Subterranean clover seed production, for example, depends to a considerable extent upon the willingness of the farmers to remove stock from the paddocks long enough for the seed heads to form. If the bids are high enough and forage supplies are not too short the acreages will be larger than if the opposite situation prevails.

Australia has the natural resources to produce a number of kinds of seeds as well as the Government seed certification services for quality control but the labor costs and the great distances to world markets may more than offset these factors. The probable exception to this is likely to be certified potatoes. The domestic market as well as the nearby tropical markets could easily be developed once disease free production is obtained.

Flower and vegetable seed production may be too limited in volume to be attractive to either the firms or the contracting farmers. This point is open to question, but, if true, Australia may continue to be an importer. However, this depends upon the availability of viable seed at a reasonable cost.

# AUSTRALIA: Imports of Grass and Field Seeds

Countries	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54
	1/	1/	1/			
	--1,000 pounds--					
U. K.	21	42	29	90	62	177
New Zealand	2,653	4,005	3,081	3,430	1,394	1,690
Other British	37	12	43	57	272	13
Brazil	1,676	--	--	--	--	--
Italy	45	26	14	258	61	155
U. S.	32	45	24	39	--	--
France	--	--	--	174	24	--
Denmark	--	99	133	83	152	236
Others	2	2	32	44	38	101
Total	4,479	4,234	3,356	4,174	2,003	2,371

1/ Includes rye.

AUSTRALIA: Exports of Grass and Field Seeds

Countries	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54
	1,000	1,000	1,000	1,000	1,000	1,000
	pounds	pounds	pounds	pounds	pounds	pounds
U. K.	3	297	--	--	--	--
New Zealand	349	2,564	155	912	198	591
U. of S. Afr.	56	6	46	50	136	127
Other British: 1/	604	23	67	224	41	39
Italy	--	--	90	--	--	--
Norway	--	1,043	465	--	--	--
Palestine	675	4	--	--	--	--
Uruguay	--	--	--	32	--	26
U. S.	1,885	1,557	1,146	970	1,214	587
Other	2/1,355	318	674	161	296	43
Total	4,927	5,812	2,643	2,349	1,885	1,413

1/ Includes 489 thousand pounds to Ceylon.

2/ Includes 695 thousand pounds to Netherlands and 597 thousand pounds to Japan.

AUSTRALIA: Seed Production

Kind of Seed	1951-52	1952-53	1953-54
	1,000	1,000	1,000
	pounds	pounds	pounds
Clover	7,231	4,684	6,590
Alfalfa	1,086	1,866	1,796
Barrel Medic	128	11	18
Strawberry clover	403	137	83
Ryegrass	1,714	914	1,127
Sudan grass	1,326	1,472	1,590
Dallis grass	34	22	22
Harding grass	253	242	130
Perennial Veldt grass	47	38	2
Evening Primrose	18	16	2
Rape	16	1/	1/
Not specified	520	448	737

1/ Included with "not specified".



## New Zealand

New Zealand has a grazing type of agriculture, but there is little immediate prospect of import requirements for American grass or legume seeds. Over much of the country the cool moist climate favors the use of ryegrasses, orchardgrass, and red and white clovers. There is a limited requirement for timothy, chou mollier, subterranean clover and Dallis grass. Australia supplies the latter two. Some alfalfa seed is needed and the French variety, DuPuits, is favored. However, the use of alfalfa is rather limited at present.

Imports of vegetable seeds are required as well as flower seeds and no restrictions are placed on their import. Several firms are distributors. Only one New Zealand firm is a producer.

The research studies under way to improve the "Tussock" and other low-carrying capacity grazing areas will probably develop a demand for grasses and legumes other than those presently used in the coastal areas. A number of American produced seeds are showing favorable results, tall oat grass, brome grass, crested wheat, and zig zag clover. The trefoils may come in for more attention because of the bloat problem.

There are considerable areas of very low-carrying capacity on both islands which need to be improved now that the rabbits are being brought under control. These areas have varying amounts of rainfall. Hence it is likely that several species of grasses and legumes will be needed. Because the soils are naturally acid in reaction it is unlikely that plants adapted to sweet soils will be used except on limited areas.

New Zealand is a producer and exporter of white clover, Chewings fescue, and brown top seed. Production is from the grazing paddocks. The area harvested for seed varies according to the need for grazing. The Chewings fescue area is gradually diminishing as that section is replanted with the improved pasture mixtures. There are very few farms that sow for seed production, consequently most of the seed production is a by-product of livestock farming. Some seeds are harvested by commercial firms who pay "in kind".

There is a small but steady demand for hybrid corn crosses to use in producing hybrid seed corn. They are imported and used by the New Zealand Department of Agriculture who contract with farmers for the production of hybrid seed corn.

New Zealand does not have a seed law but the Department of Agriculture exercises considerable control over the seed trade as well as limits exports and imports through a system of permits. If, in their judgment, imports are needed permits are granted together with the necessary exchange. Export permits are granted if there are apparent surpluses.



All imported seeds are sampled and examined for insect and disease. If necessary, shipments are fumigated or given other treatments. Weedy or low quality shipments may be ordered cleaned up. There is a fairly good working relationship between the New Zealand Department of Agriculture and the seed trade.

No seed crop forecasts are made by a government agency. However, production and import and export data are tabulated and released - usually long after the marketing season.

The Department of Agriculture obtains "Nucleus" seed from the grasslands stations each year and has it multiplied under contract. The resulting seed crop is then sold to certified seed growers for multiplication. The growers sell the next harvest to whomever they choose. In this manner improvements from selection and other techniques are constantly being incorporated into the improved varieties, whose names do not change. The Department of Agriculture inspectors carefully check the fields, harvesting operations, the sealing of the bags in the field, and finally supervise the cleaning and sealing of the "dressed" seed. Sampling is then done. The ryegrasses are given a fluorescent test and the white clover an HCN test before the final seals of approval are placed upon the bags.

Because of the importance of grazing to the national economy, all agencies of the Department of Agriculture, the Department of Scientific and Industrial Research, and the agricultural colleges are carrying on various types of research in this field. Most studies are directed towards more productive grazing. Sheep and cattle are often used in the final evaluations. Some study is being devoted to irrigated pastures since there are areas of low, or of seasonal rainfall. Some of the researchers are considering seed yields in evaluating grazing plants. This should be a minor consideration if the plant has other valuable features such as palatability and adaptation to soil and climate. The research work seems to be of a high order and well organized.

New Zealand has a very good strain of perennial ryegrass, one of Italian ryegrass and the "Short Rotation" (H-1) ryegrass. The latter has a quick growth similar to the Italian but is more perennial in persistence.

The white clover, for which New Zealand is noted, is also carefully checked at all stages for vigor, freedom from disease, and for other desirable characteristics.

Some attention is being given to orchardgrass and new varieties which are improvements over the Akaroa are being tested.

Brown top, Yorkshire Fog, and Chewings fescue are being studied in the hope that more palatable, productive strains may be developed from these indigenous species which seem to be well adapted to the higher elevations.

Improved pastures usually are undisturbed for from 5 to 7 years. They are then plowed and sown to turnips or some other root crop. Grain may follow - oats, wheat or barley, and then a crop of rape and a fallow period before the new pasture mixture is sown. The rape is important because of its value for finishing lambs. This is the practice in the sheep area. In the higher rainfall dairy areas pastures are not plowed until they "run-out" which in some cases is 20 to 30 years. The average is probably 12 to 15 years, although the approved practice is to plow it after 10 years.

The raising of supplemental feed is more common in the fat lamb area than in the dairy sections. Surplus forage from the flush season may be converted into silage or hay for the winter season. Some growers also raise Chou Mollier, swedes and turnips for the short grass season. The winter capacity of the pastures determines the stocking rate unless supplemental feeds are available. The experiment stations encourage better pasture management, such as rotation of pastures, top-dressing with phosphate, and/or such other materials as may be desired. Even rough country is treated by application from aeroplanes. Phosphate and clover seed are widely spread in this manner.

NEW ZEALAND: Seed Imports 1952-54\*  
(calendar year)

Kind of Seed	1954	1953	1952
-----1,000 pounds-----			
Clover, subter.	656	157	55
Clover, other	15	13	12
Trefoil, marsh	12	33	20
Orchard grass	274	--	526
Alfalfa	180	62	38
Timothy	190	--	15
Dallis grass	127	130	33
Grasses, other	9	6	18
Chou Mollier	40	148	54
Kale (fodder)	56	111	61
Mustard	60	37	51
Field seed, other	265	114	210
Flower seeds	26	31	22
Carrot seeds	254	25	32
Vegetable, other	132	109	159
Total	2,296	976	1,306

\*Data for earlier years are on uncleaned basis and are not comparable with "machine dressed seed".



NEW ZEALAND: Seed Exports 1952-54\*  
(calendar year)

Kind of seed	1954	1953	1952
	<u>1,000 pounds</u>	<u>1,000 pounds</u>	<u>1,000 pounds</u>
Clover, Red	1,264	1,554	1,759
Clover, White	5,819	3,279	6,900
Clover, Other and mixtures	269	297	1,126
Brown top	566	961	744
Fescue, Chewings	1,583	1,588	1,430
Ryegrass, Italian	1,547	2,392	320
Ryegrass, Perennial	5,933	5,897	3,689
Ryegrass, Other	2,780	2,786	1,058
Crested dogstail	859	1,124	725
Grasses, Other	16	87	55
Lupine	1,897	2,038	5,548
Rape	232	93	-
Field seeds, Other	99	798	413
Flower seed	10	11	15
Peas, Garden	13,096	9,125	15,029
Vegetable, Other	59	54	51
Total	36,029	32,084	38,862

\* Data for earlier years are on uncleaned basis and are not comparable with "machine dressed seed".

NEW ZEALAND: Seed Production, 1953 and 1954\*  
(Clean Seed Basis)

Kind of seed	Crop year ending October 31	
	1953	1954
	<u>1,000 pounds</u>	<u>1,000 pounds</u>
Clover, White	5,036	7,364
Clover, Suckling	250	133
Clover, Red	2,110	2,559
Clover, Other	561	218
Fescue, Chewings	2,284	2,143
Brown top	1,042	1,074
Crested dogstail	1,231	1,249
Orchard grass	1,156	1,403
Timothy	294	259
Grass, Harding	11	7
Yorkshire fog	31	26
Alfalfa	114	429
Ryegrass, Perennial	13,218	19,151
Ryegrass, Italian	2,352	2,593
Ryegrass, Other	5,864	7,651
Yarrow	3	1
Total	35,557	46,260

\* Data for earlier years are on uncleaned basis and are not comparable with "machine dressed seed".

## West Pakistan

West Pakistan has an infinite variety of climate and topography from hot barren deserts to cool mountain heights. Most of the country is practically frost-free. The seasons are cool (winter), hot (May-June), monsoon (July-August), and fall which may be and usually is hot and dry. The extensive desert areas in the south are extremely hot and dry but highly productive when irrigated. They comprise a substantial proportion of the total land area of the country.

Rainfall is equally varied from 3 or 4 inches to over 40 inches annually. The distribution, however, is such that irrigation is needed for most crops. The availability of water is therefore the critical factor.

Soils are fairly fertile and commercial fertilizers are used to a very limited extent. The soils are neutral to alkaline. Alkali is becoming a serious problem in some areas.

The irrigated farms of West Pakistan which are for the most part very small - 3 to 5 acres, are farmed intensively. Two crops a year is the normal practice in most of the irrigated areas, but only one crop is normal for the "rainfall" farms where the run-off is impounded within earthen dikes called bunds. With these two methods of farming there is little opportunity for green manures or soil improvement practices. Hence, forage crops, legumes and grasses are grown only to a very limited extent. Pakistan, therefore, offers little promise as a potential market for American field seeds in the near future.

The only forage crops encountered were Berseem clover, sudan grass and alfalfa. The two latter were practically negligible.

Vegetables are an important item in the diet of the people of Pakistan judging by the number of kinds offered for sale in the city markets. The bulk of the commercial vegetables are produced in the more favorable seasons in areas adjacent to the cities. In the summer much of the supplies are produced in the higher elevations where cooler temperatures prevail.

There is some local production of vegetable seeds near each of the larger cities. The largest area of production is near Quetta in Baluchistan. They are grown under the supervision of the state botanist. He reported licensing about 50 acres for the production of seed, the growing of which is supervised by his staff. However, the quality of production seemed to be little different from that of the producer merchants in other States. The quality of the vegetables to be seen growing in the fields, as well as the fresh vegetables in the city markets, lacked uniformity and quality which indicates that little effort is being made to produce good seed.

Pakistan does not have a seed law, seed testing laboratories, or seed processing plants. Imports of seed are restricted by the Government



to protect their foreign exchange. There are some imports of vegetable seeds. The merchants stated that they obtained about 10 percent of their requirements through import. Field seeds are not imported, but flower seeds are freely licensed. Under these circumstances the growers, of necessity, try to produce their own seeds. Many gardeners save and trade their flower seeds so that there seems to be an adequate supply with the minimum of imports.

Some of the State officials favor State seed production, although it is a question as to where qualified personnel could be obtained to operate such a scheme. However, the Government does take an active part in the production of jute, cotton, rice and wheat seed. These are the basic crops and in most cases the growers are not in a position to produce high quality seed. In fact they are hardly in a position to buy top quality seed.

With Pakistan's policy of limiting or prohibiting the imports of seeds, the supplies are practically limited to locally produced seed. Undoubtedly this influences the productiveness and quality of the crops grown, but because of the producers low levels of income they are necessarily more interested in quantity than in the quality of the seed.

Some work is under way to restore the grazing lands which constitute a considerable proportion of the land area of Pakistan. Much of this unirrigated rougher land is grazed by the nomads with their flocks of sheep, goats and camels. Because the grazing is unrestricted, erosion by both wind and rain is a serious problem. It is being studied by several agencies, including ICA.

A considerable number of American species and varieties of grasses and legumes as well as some forbs are included in the tests carried on under this range improvement program. In addition, range management practices are being tested to see which, if any, of the indigenous species will reestablish themselves. It will take several years for these tests which have been under way for only a year or two to provide an index of the plants suitable for this program. However, because the control of erosion and livestock production are important to the future of Pakistan, the grazing lands project is of great importance. Undoubtedly some of the American range grasses and forbs will be found to be useful, but the lack of control over the nomads which is a limiting and difficult problem to overcome may be a delaying factor.

PAKISTAN: Seed Trade 1954

Country	Imports	Country	Exports
	1,000 pounds		1,000 pounds
British East		Malaya and	
Africa	4	Singapore	18
Ceylon	4		
Denmark	2		
Egypt	2		
India	5,335		
Netherlands	7		
U. K.	2		
Total	5,356	Total	18

Burma

Burma has a wide variation in climate and topography in spite of being in the tropics. Much of the country lies within the rice belt. Even on the higher elevations of the north, rice is the major food crop. Because of the seasonality of the rainfall, however, rice production as well as the production of other crops depends upon irrigation.

The crop land is so intensively cultivated that the farmers have little opportunity to use green manure or forage crops. Thus there has been little or no trade in the grass and legume seeds. Cover crops are practically unknown. Recently there has been some interest in the improvement of the village communal pastures. Consequently the authorities are now engaged in making a study of them. The communal pastures vary in size from 40 to 100 acres. Undoubtedly an effort will be made to improve them although unrestricted grazing and lack of water during the dry season are major obstacles. That program may mean some demand for seed of such grasses as Guinea, Dallis, Blue Panic, Pangola, Coastal Bermuda and Pensacola Bahia.

Vegetables are important in the Burmese diet. A considerable volume of fresh vegetables move through the city markets. Some 25 kinds were on sale at the Rangoon market, most of them grown locally. During the hot seasons some supplies are shipped in from the cooler elevations farther north, although the uncertainty of transport has tended to reduce the volume. Watermelons, cabbage, sweet potatoes, corn, okra, tomatoes, chilies and squash were being handled in considerable volume. The vegetable production and trade is largely carried on by the Chinese farmers and merchants.

Apparently there is no trade in field seeds as such, although there are several (8) government seed farms producing cotton,

tobacco, rice, sugarcane and soybeans. However, they have done little breeding work except with rice. The seeds are cleaned and distributed to farmers. Imports of field seeds are usually limited to agency or group procurement.

Vegetable seeds are not freely imported, according to the officials, but the import statistics show vegetable seeds, black melon seeds and "seeds of sorts" imported. The six-months total of the above is approximately 250 thousand pounds. While the import restrictions are supposedly based upon monetary considerations, the Government is trying to stimulate seed production. Even the production of cabbage seed is being attempted at an elevation of 6,000 feet.

The Botanic Garden collects and distributes flower seeds to gardeners. Consequently there was no apparent shortage of flowers in the Rangoon gardens. Repeated inquiries failed to locate a single seed store in Rangoon. This would imply that gardeners depend upon their own or their neighbors seed supply.

Burma does not have a seed law, seed laboratory, or seed cleaning plant. However, sanitary regulations are specific in prohibiting the importation of chickpeas (Cicer), Mexican jumping beans (Sebastiania), cottonseed, etc., except by special import permit and then only by sea. It would appear from the regulations that seed shipments should be accompanied by a phytopathological certificate issued by the U.S. Department of Agriculture.

BURMA: Seed Imports - October 1954-March 1955

Months	Vegetable Seeds	Black Melon	Seeds NES	Seeds of Sorts	All seeds
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
October 1954	8			70	78
November	<u>1/</u>	12	<u>1/</u>	14	26
December	<u>1/</u>	4		39	43
January-March 1955				134	134
Six-months Total	8	16	<u>1/</u>	257	281

1/ Less than 500 pounds



## Cambodia

Cambodia, a part of the former French colony of Indochina, is an important rice producing country. The climate is tropical with highly seasonal rains which limit crop production except in the irrigated areas adjacent to the Mekong River and the Tonle Sap. A considerable portion of the country is rough and mountainous.

Crop production is mainly rice - irrigated, rainfall, and floating, although there is some corn and tobacco production where rainfall can be impounded. Other than these three there is little crop production. Livestock is a minor enterprise and limited to the native forage on the rougher lands.

There is practically no seed production except rice in Cambodia. The Government rice farm in Battambang Province multiplies seed of improved varieties and carries on rice breeding. There are no other experiment stations at present, although the Prek Leap Agricultural School does do some testing. That Institution can test seeds if needed.

Cambodia does not have a seed law or seed testing laboratory, nor are there seed merchants in the country. Saigon, before partition, was the trading center for much of Cambodia, and the merchants of that city still supply seed to the commercial vegetable growers of Cambodia. Lack of foreign exchange more or less forces procurement through Saigon and Hong Kong. Seed imports are controlled by the Office of Exterior Trade but must be approved by the Office of Foreign Exchange. There are no restrictions as to germination, purity, or country of origin.

Vegetables are important in the Cambodian diet so the city and village markets usually display a variety of locally grown products. Vegetable production is largely in the hands of Chinese farmers. There is a plan for developing a summer vegetable producing area in the higher elevations to the north, but that is dependent upon roads being built for transport.

Plans for improving livestock production are under consideration. Preliminary testing of grass and legume seeds is to be started this season. There is a good domestic and export demand for meat but the success of the program will depend upon developing an adequate forage program. Unless this program needs American varieties of legume and grass seeds there is little likelihood of Cambodia becoming a market for American field seeds.

(Import and Export data not available)

## Hong Kong

Hong Kong Colony is not an agricultural area but a market center for distribution to the markets of Southeast Asia as well as an outlet for those countries. While the Colony does have a sizable vegetable



production and is not a seed producer, the size of the seed trade is based upon the trade area served and not upon the quantities used within its borders.

Because the Colony is a market distribution area for Southeast Asia it is of interest to the American seed trade. Most of the countries in that area are lacking in foreign exchange but can buy and sell on the Hong Kong market in their own currencies. Only a few monetary permits are required and then only for a limited number of foreign currencies.

The Colony has a fairly cool climate with the rainfall concentrated in a relatively short period with the remainder of the year comparatively dry. There is little water available for irrigation. The topography is hilly and the area suitable for crop production is very limited. The soils for the most part are too acid for the growth of such lime-loving crops as alfalfa and sweetclover. There are no grazing lands within the Colony and such livestock as are produced or kept are confined to barns and pens. Hong Kong, therefore, is a rather limited user of agricultural seeds.

Hong Kong does not have a seed law, seed testing laboratory or other restrictions on the imports, exports or sale of seeds. Some of the seedsmen maintain seed testing equipment for their own use.

Very little of the Hong Kong trade is in the grass and legume seeds. However, vegetable seeds are a major item and substantial quantities are imported from China and other sources. This is to be expected since most of the countries of Southeast Asia do not use forage crop seeds, but do need a considerable volume of vegetable seeds. Chinese types are a major consideration because of the large Chinese populations in those countries.

The seedsmen of the Hong Kong market report very little difficulty in keeping seeds viable, hence preparation for shipping to that market seemingly is not the problem that it is for shipment direct to Southeast Asia. However, since the bulk of the seeds received at Hong Kong are re-shipped it would seem necessary to have them properly packed for the tropics. The merchants generally deal with a class of trade that is not particularly interested in the usual refinements which are considered necessary in the European trade. Quantity, at present, seems the more important consideration if related to price.

Imports from China are the major source of the supplies (over 90 percent) with the United States a poor second. Thailand, Malaya and Indochina are the major buyers with the Philippine Republic not far behind. This distribution would seem to give emphasis to the importance of preparing seeds for the tropics, and also indicate that ultra-quality is not necessary, in fact undesirable, for competitive purposes.

HONG KONG: Seed Imports and Exports,  
by countries, 1954

Imports		:	Exports	
	1,000	:		1,000
<u>From</u>	<u>pounds</u>	:	<u>To</u>	<u>pounds</u>
China	913	:	Malaya	211
United States	78	:	Indochina	161
Others	28	:	Philippines	122
		:	Thailand	312
		:	Japan	44
		:	Others	71
Total	1,020	:	Total	921

Indonesia

Indonesia is a densely populated country spread over a large number of islands - mostly volcanic. Although located in the tropics, there is a considerable variation in the rainfall and in some areas it is so seasonal as to limit crop production in the dry season.

The farms are small and intensively cultivated. Two and three crops of rice are the rule where water is available. Even in those areas where the water supply is insufficient for succeeding crops of rice, corn is grown as the second or third crop.

The exceptions to the size of farm are the numerous rubber, tea, and cocoa plantations which are in the areas where the rainfall has a more uniform seasonal distribution - principally in Java and Sumatra.

In the areas where the small rice farms predominate as well as in the areas of the plantations, there is very little opportunity for the use of forage crops. The plantations, as a rule, use legumes for soil improvement and to control erosion. Most of these cover crops are rather woody plants with little or no value for forage purposes such as *Crotolaria*, *Psophocarpus*, *Indigofera* and *Desmodium*.

These factors greatly limit the potential market for grass and legume seeds such as are grown in the United States. Moreover, much of the soil in Indonesia is so acid that lime-loving crops are seldom grown. The farmers are not in a position to lime their soils.

Like the other countries in the tropics, vegetables are important in the diet of the Indonesians. The city and village markets normally carry a wide variety of fresh vegetables and fruits. Much of the produce is produced by the local Chinese farmers.



According to the reports of the Indonesian Department of Agriculture, there is little or no production of grass, legume or vegetable seeds. However, they do produce legume cover crop seeds for the plantations, using the services of contracting farmers for second generation seed. The first generation is produced on the Government seed farms.

There is undoubtedly a considerable volume of seeds saved and used by the commercial vegetable growers because of the small volume of imported seed shown in the statistics.

INDONESIA: Imports of Seeds, 1954

Kind	:	Quantity
Flower and foliage	:	1,583 pounds
Agricultural plants	:	82 "
Others	:	32,855 "

Officials stated that the major portion of the "other imports" is seed potatoes which must be replaced every 3 or 4 years. Other seeds are supposed to be renewed every other year, but this is doubtful, since the small imports could not extend very far in a country of that size. The Netherlands and Australia furnish the major portions of the imports.

Indonesia does not have a seed law, seed testing laboratory, or seed processing plant. However, they do examine imported seeds for insects and diseases. A new set of plant quarantine regulations similar to those of the United States are being considered.

All imports for seeds must be approved by the Department of Agriculture before the foreign exchange is granted. The basis for the Department's approval is not clear since they do not have a statistical background to determine the needs.

Republic of the Philippines

The Philippine Republic is in the tropics, is mountainous, and well supplied with rainfall, which in many areas exceeds 100 inches annually. The country, with the exception of the higher elevations, is frost free. The soils are acid, and while lime is available in some sections, the cost of liming the soil is comparatively high.

Rice is the principal crop, although coconuts, hemp, sugar, and a number of other crops are widely grown. There is very little live stock in the Republic although an effort is being made to develop suitable forages, especially in Mindanao. Vegetables are widely grown although the major producing areas are near the cities and in the mountains near Baguio. The latter produces vegetables for Manila during the warmer seasons.

Because of the intensive cropping of the fertile, relatively level areas there is very little land available for the production of forage crops or for grazing. Whenever forests are cleared, a tough unpalatable grass takes over. It is a major problem to eradicate it prior to the starting of suitable forage crops. Most of the potential forage crops are of tropical nature. Alfalfa and the clovers can be expected to be productive only at the higher elevations and on limed soils.

Vegetables are an important part of the diet in the Philippine Republic. Many farm families in the villages try to have a vegetable garden. Much of this has been due to the "Seeds for Democracy" program. Commercially vegetables are extensively grown near the cities and as indicated above there is a very intensive commercial area in the mountains near Baguio. Most of this is the work of Philippino farmers although there are a few Chinese farmers near Manila.

The only production of seeds in the Philippines is carried on by the Bureau of Plant Industry. They contract with farmers for the growing of seeds, supervise the work, and then clean and distribute the seeds to the farmers through the Extension Service. Seed of the improved rice varieties and some field corn are their major lines of production. However, they are without cleaning or grading facilities and do not have experienced operators or technicians.

Vegetable seeds are for the most part imported, much as they were prewar. The United States is a major supplier although quantities are obtained from Hong Kong and Japan. A considerable quantity of United States vegetable seeds has been distributed under the "Seeds for Democracy" program - now a part of the "Free Asia Foundation".

Because of the difficulty in receiving and keeping the seeds viable, the College of Agriculture at Los Banos is making an intensive study of the factors which affect germination. Their work has completely changed the attitude of the Philippine villager towards "Seeds for Democracy", which in the beginning were for the most part lacking in viability when received. The College has restricted gift seeds to one variety each of nine kinds of vegetables.

The Philippine Republic does not have a seed law, nor are there regulations governing germination, purity, or noxious weedseed content of seeds offered in commerce. However, imports are limited through the import permits which are for monetary purposes. Official phytopathological certificates from the country of origin are required for imports of seeds and many plants and plant products.

The Philippine farmer and the experiment stations are well acquainted with American seeds, especially those kinds adapted to tropical conditions. They would buy more of their needs from the United States if it were not for the currency restrictions. However, as economic conditions improve in the Republic, this limitation may be relaxed because of the impact upon food supplies.



PHILIPPINES: Seed Imports and Countries  
of Origin, 1952-54

Kind of Seed and Country of Origin	1952	1953	1954
	1,000 pounds	1,000 pounds	1,000 pounds
Melon			
China	783	1,542	0
Hong Kong	491	1,480	1,019
Total	1,274	3,022	1,019
Onion			
United States	43	22	13
Spain	8	7	0
India	0	34	6
U. K.	9	3	0
Others	1	0	1
Total	61	66	20
Other vegetables			
United States	24	34	32
China	22	46	2
Hong Kong	63	23	80
India	0	16	5
Others	1/	1	1
Total	109	120	120
All other seeds			
United States	53	10	39
China	65	3	2
Hong Kong	4	4	4
Nicaragua	18	0	0
Others	0	2	7
Total	140	19	52

1/ Less than 500 pounds.

Singapore

The Crown Colony of Singapore is a tropical area, largely undeveloped, although supporting a large population. While the colony exercises control over a wide area (North Borneo and Sarawak), the agricultural production is very limited. Some kinds of vegetables are imported from the Federated States of Malaya and from Hong Kong. However, an effort will be made to expand the production of vegetables in the Singapore area.

Because of the low elevation, tropical climate, and large Chinese population, a substantial proportion of the vegetable production is of the Chinese types. However, some American seeds are used even though the seed trade is primarily in the hands of Chinese merchants.

Singapore does not have a seed law, but imported seeds must be accompanied by a phytopathological certificate from the country of origin. They have no regulations governing the qualities of seeds offered for sale. There is very little seed produced in the Colony, although it is likely that some of the Chinese farmers attempt to grow their own supplies.

Currency restrictions are a factor in controlling imports and for this reason some of the merchants do not attempt to buy except through Hong Kong. It is estimated that 70 percent of the seed imports are of Chinese origin with the remainder obtained from Australia, Burma and India. Java supplies half of the limited imports of grass seed primarily for lawns and golf courses.

The newly appointed Agricultural Officer expects to devote his time and efforts towards expanding the vegetable supply but has no immediate plans for improving the dairy or livestock production. The climate and limited area are hardly conducive to such lines of production. For these reasons, it is unlikely that a market for forage seeds will develop even though Singapore is a major seaport and the visiting ships could provide an outlet for such products if they were available.

SINGAPORE AND FEDERATION OF MALAYA:  
Seed Imports and Exports, 1954

Imports			Exports		
	1,000 pounds			1,000 pounds	
Grass Seeds	:	::	Grass Seeds	:	
U. K.	:	::	N. Borneo	:	6
Ceylon	:	::	Australia	:	11
India	:	::	Other	:	1
Java	:	::		:	
Other	:	::		:	
Total	:	::	Total	:	18
Vegetable Seeds	:	::	Vegetable Seeds	:	
Egyptian Sudan	:	::	Hong Kong	:	3
Ceylon	:	::	Borneo	:	66
India	:	::	Java	:	5
Australia	:	::	Indonesia	:	2
China	:	::	Sumatra	:	4
Indochina	:	::	British Africa	:	3
Japan	:	::	Sarawak	:	8
Thailand	:	::	Other	:	3
Total	:	::	Total	:	94

continued.

SINGAPORE AND FEDERATION OF MALAYA:  
Seed Imports and Exports, 1954 -  
Continued

Imports		::	Exports	
	1,000 pounds	::		1,000 pounds
Seeds, nes.	:	::	Seeds, nes.	:
Ceylon	: 24	::	Other	: 1
Australia	: 1	::		:
Java	: 6	::		:
Other	: 1	::		:
Total	: 32	::	Total	: 1
	:	::		:
TOTAL	: 829	::	TOTAL	: 113

Thailand

Like the neighboring countries, Thailand with its hot, humid, tropical climate is a rice producing country and has very little irrigable land devoted to livestock or other agricultural products. In the rice growing districts the farms are very small and intensively cultivated. On the rougher lands and in the hills the farm tracts are larger and the grazing lands are communal.

Because of the predominance of rice in the agricultural economy, vegetables are widely grown to supplement the food supply. Vegetable farms are to be found near most of the cities and provide year around supplies for the large city markets. Much of the vegetable business is carried on by the Thais, both the seed merchandising and the growing of the crops, although the Chinese are always present.

There is practically no seed production in Thailand, although it is probable that some of the farmers try to produce some kinds. Imports are rather substantial, coming mostly from Hong Kong, although United States seeds were being handled by several merchants. The lack of dollar exchange is one factor, but the large number of Chinese and their desire for the Chinese types of vegetables is a major factor influencing the source of imports. However, the Thai seed merchants prefer American quality and are desirous of obtaining better seed of the Chinese types from the United States.

Thailand does not have a seed law, seed laboratory, or sanitary regulations governing imports or trade in seeds. The seed testing that is necessary is done by the Petri dish method by the botanist at Chulalongkorn University, Bangkok.

Seed imports are controlled through monetary restrictions, although the more important seedsmen reported no trouble in obtaining monetary licenses for vegetable seeds. For flower seeds and rose bushes, however, the permits were not granted so freely. The vegetable seed



trade is well organized. One major firm maintains salesmen on the road throughout the year. Another extends credit to members of the cabbage growers association. The commercial production of vegetables in northern Thailand (Chieng Mai) is well organized and rather intensive. While Chieng Mai is the second largest city in the country, a considerable volume of fresh produce is shipped from that area to the Bangkok market by rail and by air. Cabbage, cauliflower, and other cool season crops are produced in the higher elevations near Chieng Mai.

The Thais recognize the problem of maintaining viability of seed in the hot, humid, tropical climate. Seeds properly dried and packed in cans will keep for a year under their conditions. There is some import in bulk and the "canning" is done locally. This serves to reduce the cost of transportation on imported seeds. Undoubtedly this method of preservation is accomplishing the objective but the cost of shipping is high and a lighter package that will give the same protection to the seed would be advantageous. It would lower the cost of transportation and put American seeds on a more competitive basis with those from Australia and Japan.

With the exception of cauliflower and tomatoes the Thais seemed to favor American varieties. They prefer the Patna cauliflower to the Snowball. American tomato varieties do not produce satisfactorily during the season. A so-called Philippine variety looks promising. Apparently it was originated at the Hawaiian Experiment Station.

The Thais are interested in livestock production but the problems of improving the communal pastures are rather difficult to overcome. However, studies have been inaugurated to determine the best kinds of forage crops adapted to the climate and soils both with and without irrigation. On the basis of preliminary tests Guinea, Cotin, Alabang X, Dallis, Pangola, Coastal Bermuda, Pensacola Bahia, and Blue Panic look promising. They are now being tested under grazing conditions. Should these tests prove successful it is likely that a livestock control law will be considered to implement the forage improvement program desired. Livestock production is considered important to the national economy. Thailand has a considerable area of land in the hills and rougher country that could be converted to livestock production and there is a good demand for meat and meat products.

(Import and Export Data not Available)

#### Viet Nam

The seed situation in Viet Nam is substantially the same as in Cambodia. Both are parts of the former French colony of Indo-China, a hot, humid, tropical country best known for its rice production. Livestock production is a minor item in their agricultural economy.

Most of the rice farms are quite small and intensively cultivated. Farms outside of the irrigated areas have larger acreages but are

seldom improved with forage crops. Green manures are not in use in Viet Nam.

Vegetable crops are important in the areas adjacent to the larger cities and at Dalat, a commercial producing area in the mountains to the northeast. Production in the Saigon area is largely by the Chinese farmers who supply the markets in Saigon and Cholon with fresh vegetables. Much of the production at Dalat is from farms owned by the Vietnamese.

There is practically no seed production in Viet Nam other than that saved by the vegetable farmers. Imports come largely from Hong Kong and France. Some American seeds were observed but they came via Hong Kong. This is true for many of the imported items since foreign exchange is limited. All imports are subject to a monetary license. There were some indications that this might be relaxed as of July 1, 1955, but the unsettled political situation probably delayed it. The Department of Agriculture must approve all import permits but they have no basis for evaluating the requests.

No other restrictions apply to the seed trade. Viet Nam does not have a seed law, nor do they impose sanitary restrictions upon imports. However, a certificate of origin is required for imported seeds.

Some research work has been attempted as a basis of forage improvement at Blao. ICA is considering similar work, especially for those areas where rice production is uncertain or limited. Undoubtedly this work will be developed in time and might result in an import requirement for forage seeds of adapted varieties.

Seed sales are largely carried on by Chinese merchants who report difficulty in obtaining import permits. A few no longer operate in this field because of this difficulty. However, Saigon is the main distribution center for Viet Nam and Cambodia and probably Laos, so the volume is substantial.

The problem of maintaining the viability of imported seeds is the same as in the countries previously described. However, the merchants interviewed did not seem to be concerned to the same degree as those in Thailand. Perhaps this is due to the large proportion of the seed coming from Hong Kong. It was noted that none of the seed on display was packed in tin or other moisture-proof coating, although seeds purchased in Saigon and sent to Beltsville for germination tests were no poorer in this respect than those from neighboring countries. Nevertheless this problem should be considered before endeavoring to enter the Viet Nam market. Statistics of imports and exports were not available although the permits office admitted issuing permits for 10,000 pounds of seed for the period January-June 1955.

Japan

Seed import and export data for Japan are included to indicate the volume of trade. Japan, Korea, and Formosa were not covered in this survey. Production statistics for Japan are expected to be available soon.

JAPAN: Seeds Imports and Exports, 1954

Kind of Seed	Imports	Exports
	1,000	1,000
	pounds	pounds
Sugar beet	406	1
Vetch	238	--
Grass and pasturage, n.e.s.	950	20
Vegetable and flower	340	339
Seeds for planting, n.e.s.	98	46
Total	2,032	406





